INSULIN TYPE	ONSET	PEAK	DURATION	COMMENTS *Regular testing of blood glucose and A1C is recommended to assess medication effect.*
Very Short Acting Insulin lispro Humalog (Lilly)	0-15 minutes	30-90 minutes	2-4 hrs	Both insulin lispro (Lilly) and insulin aspart (NovoNordisk) solutions are very short acting products. Both are available mixed with protamine as fixed-ratio combinations, which provide the benefit of rapid and intermediate action.
Insulin aspart NovoLog (NovoNordisk)	10-20 minutes	60-180 minutes	3-5 hours	Humalog mix 75/25 is a mixture of 75% insulin lispro protamine suspension and 25% insulin lispro. NovoLog 70/30 is a mixture of 70% insulin aspart protamine and 30% insulin aspart.
Short Acting (Regular)	30 minutes-1 hr	2-4 hrs	4-8 hrs	NPH and regular insulins are also available as fixed-ratio combinations of 50/50 and 70/30.
Intermediate Acting (NPH/Lente)	2-4 hrs	4-10 hrs	10-16 hrs	NPH and regular insulins are also available as fixed-ratio combinations of 50/50 and 70/30.
Long Acting Insulin glargine Lantus (Aventis)	4-6 hrs	No pronounced peak	18-24 hrs	Insulin glargine (Lantus) is indicated for once daily subcutaneous administration at bedtime in patients who require basal (long-acting) insulin for the control of hyperglycemia. Insulin glargine (Lantus) must NOT be diluted or mixed with any other insulin or solution, and is not intended for intravenous administration.
Long Acting (Ultralente)	4-6 hrs	8-20 hrs	24-28 hrs	

The onset, peak, and duration of any insulin preparation may vary depending on injection site, exercise, depth of injection, and other variables.

Reduced hyperglycemia and an improvement in glucose toxicity will occur in type 2 diabetes, given sufficient doses of insulin. Individuals with moderately severe type 2 disease, defined as a fasting plasma glucose 140–200 mg/dl, will often show sufficient response to a single or twice-daily dose of insulin.

One study has suggested that bedtime administration is most effective when using intermediate-acting insulin. Another study suggested that 9:00 p.m. is a reasonable time for the single daily insulin dose when used in combination with sulfonylureas. The former study reported improved glycemic control, and the latter study reported less weight gain with the bedtime or evening insulin doses when compared to morning insulin doses.

Individuals with severe type 2 diabetes, defined as a fasting plasma glucose >200 mg/dl, or those who have proved not responsive to the above-mentioned regimens, may require frequent insulin dosing. This usually requires the addition of short-acting insulin before meals.

The total daily insulin doses for type 2 diabetes may range from 0.4–1.2 U/kg/day. Please be aware that in insulin-resistant patients, doses of >1.5 U/kg/day may be required.

Total daily dosage for people with type 1 diabetes may range from 0.3-0.5 U/kg/day.

The degree of glucose lowering is dose-related. Studies have demonstrated a lowering of fasting glucose of up to 190 mg/dl from baseline in patients with type 2 diabetes treated with insulin.

Source: White, Jr., JR, The Pharmacological Reduction of Blood Glucose in Patients With Type 2 Diabetes Mellitus. Clinical Diabetes. Vol. 16 No. 2, 1998.

COMPARISON OF ORAL ANTIDIABETIC AGENTS

	Biguanides	Sulfonylureas	Meglitinides	Thiazolidinediones	α-Glucosidase Inhibitors
Change in A1C (%)	1.5-2.0	2.0-2.5	0.7-1.0	0.5-2.0	0.5-0.8
Onset of action	Slow dose titration	Fast	Fast	Slow mode of action	Slow dose titration
Lipid effect	Favorable	Neutral	Neutral	Favorable	
Hyperinsulinemia	Decrease ↓↓	Increase ↑↑↑	Increase ↑↑	Decrease ↓↓↓	Neutral
Cardiovascular	Improved (UKPDS)	Uncertain	Unknown	Improved (small studies)	Neutral
Weight gain	No	Yes	Yes	Yes	No
Hypoglycemia	No	Yes	Yes	No	No
Long term safety	Yes	Yes	No	No	Yes
Requires monitoring	Renal function	Hypoglycemia	Hypoglycemia	Liver function before and bimonthly for 1st year	Liver function with high doses
Use in organ failure					
Renal	Contraindicated	Caution	Yes	Yes	Yes
Hepatic	Contraindicated	Caution	Yes	Contraindicated	Relative contraindication
Heart	Contraindicated	Caution	Caution	Contraindicated	Yes
Common side effects	Abdominal pain, diarrhea, flatulence	Hypoglycemia	Hypoglycemia	Weight gain, fluid retention, CHF	Abdominal pain, diarrhea, flatulence
Serious side effects	Lactic acidosis	Hypoglycemia	Hypoglycemia	Hepatotoxicity	None
Prevention of diabetes	Possible	No	No	Possible	Possible
Preservation of ß cell function	Possible	No	Possible	Possible	Neutral

Source: Heart Disease, © 2003 Lippincott, Williams and Wilkins